We claim:

1. An apparatus for encoding information represented by at least first and second data items in a reference signal complex, said reference signal complex including at least first and second spectral components having first and second frequencies, respectively, said first and second frequencies being different, said first and second spectral components having first and second reference amplitudes, respectively, said apparatus including:

means for adjusting said first reference amplitude of said first spectral component of said reference signal complex in accordance with said first data item; and

means for adjusting said second reference amplitude of said second spectral component of said reference signal complex in accordance with said second data item.

2. An apparatus as defined in claim 1, further comprising:

means for forming an encoded signal complex including at least said adjusted first and second spectral components.

3. An apparatus as defined in claim 1, wherein said reference signal complex further includes at least third and fourth spectral components having third and fourth frequencies, respectively, said third and fourth frequencies being different, said third and fourth spectral components have first and second reference phase offsets, respectively, said information being further represented by third and fourth data items, said apparatus further comprising:

means for adjusting said first reference phase offset of said third spectral component of said reference signal complex in accordance with said third data item; and

means for adjusting said second reference phase offset of said fourth spectral component of said reference signal complex in accordance with said fourth data item.

4. An apparatus as defined in claim 3, wherein said third spectral component and said third frequency are said first spectral component and said first frequency, respectively, and wherein said fourth spectral component and said fourth frequency are said second spectral component and said second frequency, respectively.

5. An apparatus as defined in claim 3, further comprising:

means for forming an encoded signal complex including at least said adjusted first, second, third and fourth spectral components.

6. An apparatus as defined in claim 2, further comprising:

means for extracting said adjusted first spectral component from said encoded signal complex;

means for retrieving said first data item in accordance with said adjusted first reference amplitude of said adjusted first spectral component of said encoded signal complex;

means for extracting said adjusted second spectral component from said encoded signal complex; and

means for retrieving said second data item in accordance with said adjusted second reference amplitude of said adjusted second spectral component of said encoded signal complex.

7. An apparatus as defined in claim 5, further comprising:

means for extracting said adjusted first spectral component from said encoded signal complex;

means for retrieving said first data item in accordance with said adjusted first reference amplitude of said adjusted first spectral component of said encoded signal complex;

means for extracting said adjusted second spectral component from said encoded signal complex;

means for retrieving said second data item in accordance with said adjusted second reference amplitude of said adjusted second spectral component of said encoded signal complex;

means for extracting said adjusted third spectral component from said encoded signal complex;

means for retrieving said third data item in accordance with said adjusted first reference phase offset of said adjusted third spectral component of said encoded signal complex;

means for extracting said adjusted fourth spectral component from said encoded signal complex; and

means for retrieving said fourth data item in accordance with said adjusted second reference phase offset of said adjusted fourth spectral component of said encoded signal complex

8. A method for encoding information represented by at least first and second data items in a reference signal complex, said reference signal complex including at least first and

second spectral components having first and second frequencies, respectively, said first and second frequencies being different, said first and second spectral components having first and second reference amplitudes, respectively, said method including:

adjusting said first reference amplitude of said first spectral component of said reference signal complex in accordance with said first data item; and

adjusting said second reference amplitude of said second spectral component of said reference signal complex in accordance with said second data item.

9. A method as defined in claim 8, further comprising:

forming an encoded signal complex including at least said adjusted first and second spectral components.

10. A method as defined in claim 8, wherein said reference signal complex further includes at least third and fourth spectral components having third and fourth frequencies, respectively, said third and fourth frequencies being different, said third and fourth spectral components have first and second reference phase offsets, respectively, said information being further represented by third and fourth data items, said apparatus further comprising:

adjusting said first reference phase offset of said third spectral component of said reference signal complex in accordance with said third data item; and

adjusting said second reference phase offset of said fourth spectral component of said reference signal complex in accordance with said fourth data item.

11. A method as defined in claim 10, wherein said third spectral component and said third frequency are said first spectral component and said first frequency, respectively, and wherein said fourth spectral component and said fourth frequency are said second spectral component and said second frequency, respectively.

12. A method as defined in claim 10, further comprising:

forming an encoded signal complex including at least said adjusted first, second, third and fourth spectral components.

13. A method as defined in claim 9, further comprising:

extracting said adjusted first spectral component from said encoded signal complex;

retrieving said first data item in accordance with said adjusted first reference amplitude of said adjusted first spectral component of said encoded signal complex;

extracting said adjusted second spectral component from said encoded signal complex; and

retrieving said second data item in accordance with said adjusted second reference amplitude of said adjusted second spectral component of said encoded signal complex.

14. A method as defined in claim 12, further comprising:

extracting said adjusted first spectral component from said encoded signal complex;

retrieving said first data item in accordance with said adjusted first reference amplitude of said adjusted first spectral component of said encoded signal complex;

extracting said adjusted second spectral component from said encoded signal complex;

retrieving said second data item in accordance with said adjusted second reference amplitude of said adjusted second spectral component of said encoded signal complex;

extracting said adjusted third spectral component from said encoded signal complex;

retrieving said third data item in accordance with said adjusted first reference phase offset of said adjusted third spectral component of said encoded signal complex;

extracting said adjusted fourth spectral component from said encoded signal complex; and

retrieving said fourth data item in accordance with said adjusted second reference phase offset of said adjusted fourth spectral component of said encoded signal complex

15. An apparatus for encoding information represented by at least first and second data items in a reference signal complex, said reference signal complex including at least first and second spectral components having first and second frequencies, respectively, said first and second frequencies being different, said first and second spectral components having first and second reference amplitudes, respectively, said apparatus including:

a first modulator adapted to adjust said first reference amplitude of said first spectral component of said reference signal complex in accordance with said first data item; and

a second modulator adapted to adjust said second reference amplitude of said second spectral component of said reference signal complex in accordance with said second data item.

16. An apparatus as defined in claim 15, wherein said first modulator includes:

a first latch adapted to store a digital representation of said first data item;

a first D/A converter coupled to said first latch adapted to convert said digital representation of said first data item to an analog representation; and

a first amplifier coupled to said first D/A converter and to a first oscillator that generates a first sinusoidal signal having said first frequency, said first amplifier being adapted to adjust an energy level said first sinusoidal signal in accordance with said analog representation of said first data item.

17. An apparatus as defined in claim 15, further comprising:

a first demodulator adapted to receive said adjusted reference signal complex and to retrieve said first data item in accordance with adjusted first reference amplitude of said adjusted first spectral component; and

a second demodulator adapted to receive said adjusted reference signal complex and to retrieve said second data item in accordance with adjusted second reference amplitude of said adjusted second spectral component.

18. An apparatus as defined in claim 17, wherein said first demodulator includes:

a first bandpass filter adapted to extract a first sinusoidal signal having a first energy level and said first frequency from said received adjusted reference signal complex;

a first rectifier coupled to said first bandpass filter that detects said first energy level and generates an analog representation of said adjusted first reference amplitude in accordance with said energy level and said first reference amplitude; and

an A/D converter coupled to said first rectifier that converts said analog representation of said adjusted first reference amplitude to a digital representation, said digital representation corresponding to said data item.

19. An apparatus as defined in claim 15, further comprising:

a first sampler that generates a time domain representation of said reference signal complex;

a first FFT coupled to said first sampler and said first and second modulators that generates a frequency domain representation of said reference signal complex from said time domain representation, said first and second modulators being operative on said frequency domain representation to produce a frequency domain representation of an encoded signal complex including at least said adjusted first spectral component having said adjusted first amplitude and said adjusted second spectral component having said adjusted second amplitude; and

a first IFFT adapted to receive said frequency domain representation of said encoded signal complex and to generate a time domain representation of said encoded signal complex.

20. An apparatus as defined in claim 19, wherein said first sampler oversamples said reference signal complex by a factor of L, said apparatus further comprising:

a decimator that decimates said time domain representation of said encoded signal complex up to said factor of L.